Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
Wireless Telecommunications Bureau Seeks to Supplement the Record on the 600 MHz Band Plan	)	GN Docket No. 12-268

COMMENTS OF MOTOROLA MOBILITY LLC

Motorola Mobility LLC ("Motorola Mobility") hereby responds to the Public Notice issued by the Federal Communications Commission ("Commission") seeking additional public comment on 600 MHz band plan options.[1] The Commission initially discussed potential band plan options for advanced wireless use of the 600 MHz spectrum in last year's Notice of Proposed Rulemaking on incentive auctions.[2] As further detailed below, Motorola Mobility reiterates its support for the previously described "Down from Channel 51" band plan,[3] which is superior to the other alternatives raised to date in this proceeding with respect to both interference protection and handset design.

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1 *See* Wireless Telecommunications Bureau Seeks to Supplement the Record on the 600 MHz Band Plan, *Public Notice*, GN Docket No. 12-268, DA 13-1157 (May 17, 2013) ("Notice").

2 Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, *Notice of Proposed Rulemaking*, 27 FCC Rcd 12357 at ¶ 126 (2012) ("Incentive Auctions NPRM").

3 The Incentive Auctions NPRM detailed an "alternative" band plan proposal, known as the "Down from Channel 51" band plan, that would clear broadcast channels starting at channel 51 and expand downward, organizing the spectrum in an uplink portion, a downlink portion, and a guard band, with a duplex gap between the uplink and downlink bands. Incentive Auction NPRM at ¶ 178.

As previously noted by Motorola Mobility and other commenters, the Down from Channel 51 band plan offers several advantages that will benefit consumers and providers alike over the Commission's stated preference.[4] First, it avoids placing television broadcast stations in the spectrum between the uplink and downlink bands, which would result in a smaller duplex gap. Antenna handset design is simplified by reduced antenna bandwidth. Second, the absence of television broadcast stations in the duplex gap helps eliminate a source of intermodulation products that would otherwise fall into the downlink receive band and interfere with wireless broadband devices. By segregating broadcast and advanced wireless handsets, the Down from Channel 51 band plan also minimizes the potential for reverse intermodulation generated by the mixing of television transmissions and mobile device transmit signals. Such intermodulation products would occur on-channel and could not be filtered at the handset resulting in degraded service to consumers. The Commission's original 600 MHz band plan proposed in the Incentive Auctions NPRM would exacerbate the handset design and interference problems that the Down from Channel 51 band plan would seek to minimize.

The subject Public Notice seeks additional comments on 600 MHz band plan options and introduces a variation of the Down from Channel 51 band plan. As described in the Public Notice, the "Down from Channel 51 Reversed" band plan would similarly clear broadcast television channels starting at Channel 51 and expand downward but would reverse the location of the downlink and uplink bands. The other significant difference to the original Down from

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[4] *See, e.g.* Comments of Motorola Mobility, GN Docket No. 12-268 (filed Jan. 25, 2013) ("Motorola Mobility Comments"); *Ex Parte* Letter from AT&T, Inc., Intel Corp., National Association of Broadcasters, Qualcomm, T-Mobile and Verizon Wireless, GN Docket No. 12-268 (filed Jan. 4, 2013); Comments of T-Mobile USA, Inc., GN Docket No. 12-268 at 10-13 (filed Jan. 25, 2013); Reply Comments of Ericsson, GN Docket No. 12-268 at 13-29 (filed Mar. 12, 2013); Comments of Alcatel-Lucent, GN Docket No. 12-268 at 12-18 (filed Jan. 25, 2013); Comments of RIM, GN Docket No. 12-268 at 7-8 (filed Jan. 25, 2013).

Channel 51 band plan is that the downlink band would begin after a guard band at Channel 51 (698 MHz) to protect the Lower 700 MHz A Block operations on Channel 52.[5]

The Down from Channel 51 Reversed band plan would require the establishment of a guard band between 600 MHz downlink transmitters and 700 MHz base receivers. The original Down from Channel 51 band plan offers many of the same benefits of the reversed plan, but does so without needing a guard band with the 700 MHz band. The costs of establishing a new guard band may be acceptable if the Down from Channel 51 Reversed band plan succeeded in eliminating potential sources of interference caused by intermodulation effects and harmonics, but this is not the case. Reverse intermodulation products generated by handset transmissions and TV broadcast transmissions would continue to be a concern for the mobile handset receive band (*i.e.*, the downlink). In addition, the Down from Channel 51 Reversed band plan would introduce 3rd order harmonic signals into the 2 GHz PCS band.

The Notice states that the Down from Channel 51 Reversed band plan framework can maintain a uniform downlink band nationwide and allow for market variation in the amount of uplink spectrum offered without placing high power services in the duplex gap.[6] Note, however, that market variation in uplink spectrum may require additional band classes to be defined. Otherwise, there will be no attenuation of the TV broadcast channel at the power amplifier in the device and therefore handsets designed to operate across the entire uplink allocation will become disabled if they attempt to operate in an area where it has not been fully cleared.

Motorola Mobility recognizes that the development of a 600 MHz band plan poses challenges and that the industry will likely need to consider and solve harmonic and intermodulation issues with any plan the Commission ultimately adopts. However, Motorola

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5 Notice at 3.

6 *Id.* at 4.

Mobility does not see – and the Notice does not identify – a benefit resulting from reversing the 600 MHz uplink and downlink band that would outweigh the impact of creating a spectrum adjacency of incompatible uplink/downlink operations at 698 MHz.

Finally, the Commission should reject using a Down from Channel 51 framework with unpaired TDD blocks and reject allowing the operation of television broadcast stations within the duplex gap in more spectrum constrained markets.[7] Both of these concepts would compromise the full utility of the 600 MHz band for advanced wireless services. As participants to this proceeding have noted, TDD operations in the 600 MHz band would create serious risks of harmonic interference to FDD operations in other bands.[8] In addition, allowing television stations within the duplex gap would require a much larger duplex gap than that which is technically reasonable to prevent interference to wireless handsets. Accordingly, the Commission should adopt the Down from Channel 51 band plan as originally proposed and decline to place television stations in the duplex gap.

Respectfully submitted,

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[7] Notice at 5-6.

[8] *See e.g.*, concerns raised by Qualcomm regarding TDD in *Ex Parte* Letter from Qualcomm, Inc., GN Docket No. 12-268 (filed May 2, 2013).